

***Habia atrimaxillaris* (DWIGHT & GRISCOM) 1924 –
the black-cheeked ant-tanager.
History of an endemic bird species from SW Costa
Rica, from discovery to endangered status**

***Habia atrimaxillaris* (DWIGHT & GRISCOM) 1924 –
tangara hormiguera cabecinegra.
Historia de una especie de ave endémica del Sudoeste de
Costa Rica – desde su descubrimiento a su estatus de peligro**

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Abstract: A comprehensive history of research concerning the endemic black-cheeked ant-tanager *Habia atrimaxillaris* outlines the period from first collections in 1922 until recent conservation efforts. The species is used as an example for describing ornithological research in the Golfo Dulce region including museum collections and biographies of ornithologists involved. The fate of 53 museum specimens collected is outlined in detail. Changing land use as part of the region's history shows the increasing attitude towards conservation efforts which led to the foundation of protected areas and ultimately to the "Regenwald der Österreicher" and the Tropical Research Station La Gamba. Further studies should concentrate on the autecology of this species and on the dangers arising from forest fragmentation.

Key words: *Habia* (*Phoenicothera*) *atrimaxillaris*, tangara hormiguera cabecinegra, Schwarzwangenhabia, Costa Rica, endemic species, Rainforest of the Austrians, tropical research station La Gamba, history of ornithology, forest fragmentation, ecological corridors.

Resumen: Se esboza la historia de las investigaciones relacionadas con el ave endémica "Tangara hormiguera cabecinegra" *Habia atrimaxillaris* desde de su primera colección en 1922 hasta los recientes esfuerzos de conservación. La especie es usada como un ejemplo para describir las investigaciones ornitológicas en la región de Golfo Dulce, incluyendo colecciones de museos y biografías de los ornitólogos relacionados. El destino de 53 especímenes de museo es delineado en detalle. Cambios en el uso de la tierra, como parte de la historia de la región, muestran un aumento en los esfuerzos de conservación que llevan a la fundación de áreas protegidas, en especial al Bosque de los Austriacos y la estación de Investigación Tropical La Gamba. Estudios posteriores deberían concentrarse en la autoecología de las especies y en los peligros derivados de la fragmentación del bosque.

Palabras clave: *Habia* (*Phoenicothera*) *atrimaxillaris*, tangara hormiguera cabecinegra, Schwarzwangenhabia, Costa Rica, especie endémica, Bosque de Los Austriacos, estación de investigación tropical La Gamba, historia de la ornitología, fragmentación del bosque, corredores ecológicos.

Introduction

In January 2006, G. Aubrecht and S. Weigl had the opportunity to observe *Habia atrimaxillaris* in its natural habitat near the Tropical Station La Gamba in SW Costa Rica together with W. Huber (Fig. 1). This exciting impression raised the idea of looking into regional Costa Rican ornithological history by means of demonstrating the different stages in the historical discovery of *Habia atrimaxillaris* as an exemplary focus, as was previously performed with *Pyrrhula murina* for the or-

nithology of the Azores islands (AUBRECHT 2000). Therefore this paper is not a monograph about *Habia atrimaxillaris* but a kind of comprehensive "species biography" including biographies of people and a historical sketch of the region. According to JOHNSON (2005), type specimens and their labels also reveal information on the development of descriptive natural history and publications, the network of describers and collectors and the character of collecting in different regions of the world.

Fig. 1:
H. atrimaxillaris,
adult with prey
(Photo W. Huber)



The time span from the first collection of *Habia atrimaxillaris* in 1922 until today comprises an astounding evolution of ornithological methods and changing attitudes towards bird conservation. This led from collection based studies of museum specimens to field ornithology in combination with illustrated field guides to ecological investigations, bird watching tourism and conservation efforts. It is an ambition of this paper to show that all of these methods including museum collections are necessary for scientific studies as a basis for species and environmental conservation. Since WILLIS' (1972) autecological studies, the scarce available information seems to have been gathered only by chance. The history of human settlement in the region is exemplary for the steadily increasing forest fragmentation. The black-cheeked ant-tanager is ecologically bound to lowland forests and faces the danger that having isolated populations may have resulted in its recently acquiring the status of an endangered species. Conservation efforts must focus on keeping forest areas intact and on linking isolated forest fragments by ecological corridors (LAURANCE et al. 2002, SIGEL et al. 2006).

Methods

Information gathering started with literature work and a search at the Electronic Bulletin of European Bird Collections (ebeac). Contacts to museum collections, specimen databases, experts and ornithologists involved as well as my interest increased gradually.

Results and discussion

The first collections in the 1920s

A. P. Smith collected 26 specimens of *Habia atrimaxillaris* between July 16th, 1922 and December 16th, 1929 at Puerto Jiménez. These specimens were subsequently sold to the collections of Havemeyer (now MCZ Harvard and YPM), Dwight (now AMNH), Dickey (now UCLA), YPM, Armstrong (now FMNH) and FMNH (Table 1). During his time in Costa Rica Smith continued working for the Dwight collection (DWIGHT & GRISCOM 1924). GRISCOM (1933) wrote about Smith's collecting between January 1926 and December 1931 in Costa Rica and Panama concerning the Havemeyer collection "For some years past Mr. Henry O. Havemeyer of Mahwah, New Jersey, has been acquiring collections of Costa Rican birds from Mr. Austin Paul Smith, in fact ever since the late Dr. Jonathan Dwight ceased to be Smith's chief customer." Two specimens from the Dickey collection (HARRIS 1934, WOOD 1932) were donated to UCLA in 1940 (MOLINA 2006). Austin Paul Smith collected in Costa Rica just when Dickey became interested in birds of the Pacific slope. Four specimens came to the E. E. Armstrong collection and from there to FMNH in 1931, and 3 specimens arrived at FMNH directly in 1930 (pers. comm. J. Bates). The 26 specimens collected by A. P. Smith in the 1920s were the only ones for 35 years until collecting started again in the 1960s around newly established field stations on the Osa peninsula (BURLINGAME 2002).

Species description

In 1924 Jonathan DWIGHT & Ludlow GRISCOM described the species as *Phoenicotheraupis atrimaxillaris*:

"Descriptions of new birds from Costa Rica" in the journal "American Museum Novitates" 142: "The birds described below represent the outstanding results of a very fine collection made during the last four years by Austin Paul Smith, who deserves the greatest credit for discoveries of such interest in a country which has been generally regarded as thoroughly explored. We hope to publish later a complete report covering the entire collection. ..."

... "*Phoenicotheraupis atrimaxillaris*, new species. ...

Type – No. 55666, Dwight Collection; male ad.; Puerto Jiménez, Golfo Dulce, Prov. de Puntarenas, Costa Rica; July 16, 1922; Austin Paul Smith. ...

Specimens examined

Phoenicotheraupis atrimaxillaris. – Costa Rica: Puerto Jiménez, 2 ♂ ad., 3 ♂ im., 2 ♀.

Phoenicotheraupis gutturalis. – Colombia: Honda, Tolima, 1 ♂.

Austin Paul Smith (Fig. 2) (ca. 1881, Ohio – ca. 1956, Costa Rica, pers. comm. S. Casto). Son of George W. and Sadie J. Smith. His family moved to Brownsville, Texas, in the early 1900s where Smith started collecting (Anonymus 1917). He published in *Auk* and *Condor* between 1907 and 1932 (elibrary.unm.edu/Sora/) and in *Oologist* between 1918 and 1937. In 1912 Smith already advertised in the journal *Oologist* to exchange Texas sets with nests (pers. comm. L. Kiff). He moved to San José in Costa Rica in 1920 (PALMER 1928, 1929, SMITH 1932) where he collected in Central America at least until the mid 1940s. In September 1922, August 1924 and June 1925 Smith advertised in *Oologist* to sell skins of Costa Rican birds to accredited individuals and institutions. Smith's residency in Costa Rica is mentioned to be in Villa Quesada (SMITH 1934 a,b) and Zarcero (SMITH 1935, 1937). He died in Costa Rica around 1956 (STANDLEY & WILLIAMS 1963). Smith was specialised in collecting birds but is also known as botanical collector (STANDLEY & WILLIAMS 1963) being commemorated in scientific bird and plant taxa. Already during his time in Texas he collected for Jonathan Dwight as mentioned by GRISCOM & CROSBY (1925): "The second [collecting in Texas] was made by Austin Paul Smith between 1908 and 1912. It consists of about 1,800 skins now in the Dwight Collection. Many records of rarities and extensions of ranges are based on these collections ...". Photos of A. P. Smith were published in *Oologist* (1925, 42, pp. 99, 101). LECROY (2003) mentions him as collector of type specimens of the American Museum of Natural History. Despite all these honourable words, the biography of A. P. Smith is still very scarce and only scattered information seems to exist. The bird collection of the biology centre/Upper Austrian State Museum also holds specimens collected by A.P. Smith, obtained via the collection F. Morton.

Phoenicothera fuscicauda fuscicauda. – Nicaragua: 6 ♂, 1 ♀. Costa Rica, 8 ♂, 5 ♀.

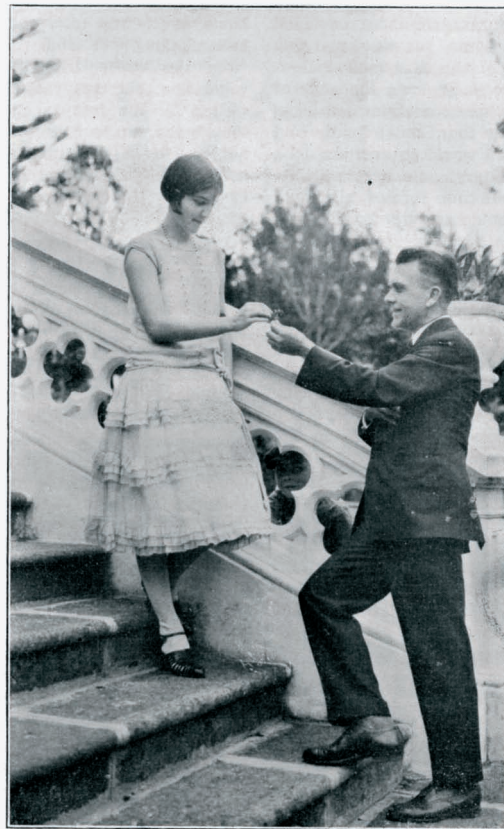
This new species is a partial connecting link between *P. gutturalis* and *P. fuscicauda*, though much nearer the former. It differs from the latter in being much darker above with no suggestion of red; the crown-patch and red of the underparts are very much paler. The great extent of the black on the chin and the broad black malar stripe are unique characters in the genus. The discovery of so distinct a species in western Costa Rica at the present time can only be regarded as astonishing and unexpected. ..."

Taxonomic situation of genus *Habia* and changes in nomenclature:

Genus *Habia* BLYTH 1840: Cuvier's Anim. Kingd. p. 184

Genus *Phoenicothera* CABANIS 1850: Museum Heineanum Th. 1: p. 24

Habia rubica (VIEILLLOT) 1817: Nouv. Dict. Hist. Nat. 14: p.107



Austin Paul Smith in Costa Rica, with a Very Pretty Native Bird

Fig. 2: Austin Paul Smith (Oologist 1925)

Habia gutturalis (SCLATER P.L.) 1854: Ann. Mag. Nat. Hist. (2)13: p. 25

Habia fuscicauda (CABANIS) 1861: J. Orn. 9: p. 86

Habia cristata (LAWRENCE) 1875: Ann. Lyc. Nat. Hist. N.Y. 11(1876): p. 70

Habia atrimaxillaris (DWIGHT & GRISCOM) 1924: Am. Mus. Novit. 142: p. 4

HELLMAYR (1936) revising the tanagers made *Phoenicothera atrimaxillaris* a subspecies, *Habia gutturalis atrimaxillaris* as PETERS (1937) comments upon: "... the aggregation of forms hitherto grouped among two species, *Habia fuscicauda* and *Habia salvini*, are considered conspecific, and to these is added *Habia gutturalis*, which incidentally is the oldest name ...". In contrast EISENMANN (1955) lists *Habia atrimaxillaris* as a distinct species and cites: "HELLMAYR (1936) and others consider these forms races of *H. gutturalis*". PARKES (1969) confirms the species status of *H. atrimaxillaris* and PAYNTER (1970) lists *Habia atrimaxillaris* but still mentions "Possibly a race of *Habia fuscicauda* (STORER)" whereas DAVIS (1972) writes in a footnote "considered a race of *H. gutturalis* by some". WOLTERS (1975-1982) possibly introduced the first German name for *Habia atrimaxillaris*, "Schwarzwangenhabia" and adds "conspecific with *H. fuscicauda*". SIBLEY & MONROE (1990) refer to WILLIS (1972) when listing *H. atrimaxillaris* as a

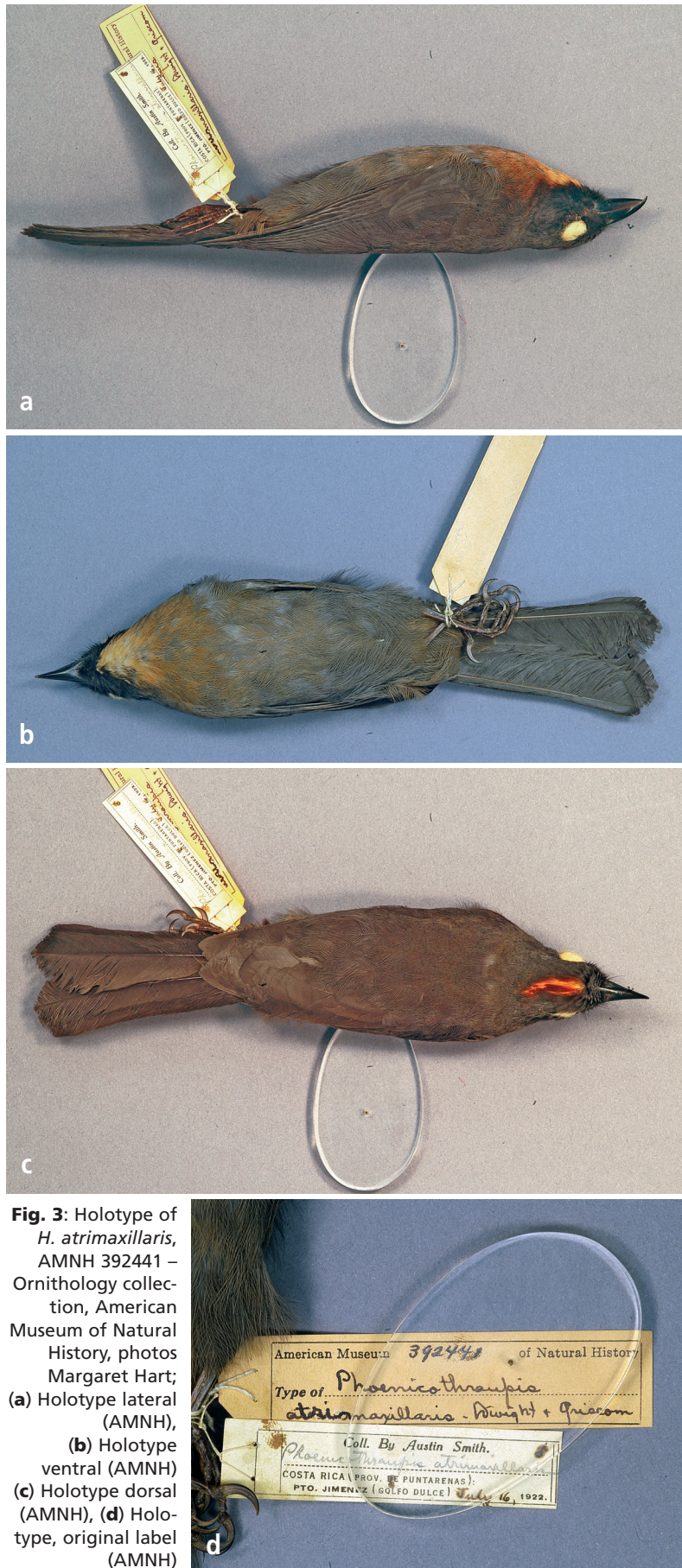


Fig. 3: Holotype of *H. atrimaxillaris*, AMNH 392441 – Ornithology collection, American Museum of Natural History, photos Margaret Hart; (a) Holotype lateral (AMNH), (b) Holotype ventral (AMNH) (c) Holotype dorsal (AMNH), (d) Holotype, original label (AMNH)

distinct species. The taxonomic situation is also clear in A.O.U. (1983), A.O.U. (1998), A.O.U. (2002), BARRANTES et al. (2002) and BANKS et al. (2003).

The designated type of *Phoenicotherapia atrimaxillaris* (DWIGHT & GRISCOM 1924) is held by the AMNH (originally in the Dwight collection) (Fig. 3):

Male, skin, collected at Puerto Jiménez, 1922/7/16 (AMNH no. 392441, no. in Dwight Coll. 55666).

The description of *Phoenicotherapia atrimaxillaris* was made when Griscom worked at the American Museum where Dwight's collection was stored and both were especially interested in central American birds.

Ludlow Griscom (June 17th, 1890, New York – May 28th, 1959, Cambridge, USA) (PETERSON 1965, DAVOIS 1994, BEOLENS & WATKINS 2003)). Education at Harvard and Columbia University (law). In 1912 he switched over to studying biology at Cornell University (student of Arthur A. Allen, America's first professor of ornithology). Soon he found contacts to the Linnean Society (of which he was elected president in 1927) and worked for the American Museum of Natural History under Frank M. Chapman from 1917 until 1927. In 1927 he changed to the Museum of Comparative Zoology in Cambridge where he became research ornithologist and editor. Griscom is believed to symbolise the gap between the old shot-gun ornithologists and the new field ornithologists using binoculars. As a taxonomist his geographically interest focused on Central America where he started expeditions as early as 1917. He also collected 40.000 herbarium sheets mostly deposited in the Gray Herbarium at Harvard. Ill with strokes since 1949 he died 10 years later. Griscom influenced generations of field ornithologists. His major works were published between 1923 and 1959.

Jonathan Dwight (December 8th, 1858, New York – February 22nd, 1929, New York, USA (FLEMING 1930)). Dwight studied at Harvard University from 1876 until 1880. Influenced by William Brewster, he started publishing in 1879. After university, he joined his father as an engineer but became interested in medicine and graduated from the Medical School of Columbia University in 1893. After some years of medical work, he retired, devoting his time wholly to ornithology. He collected bird specimens between 1878 and 1930 (MEARNS & MEARNS 1998). Part of his collection was stored at the American Museum after 1904, while the main collection was held together with that of his friend, Dr. Louis Bishop, in New Haven until 1909 when the whole collection came to the American Museum. Late in his life, Dwight became interested in Central American birds, especially those from Costa Rica. At the time of his death, his collection amounted to some 65.000 skins. Nests and eggs and a representative series of North American birds came to the museum at Springfield, Massachusetts, and the main collection with 55.000 skins passed to the American Museum.

Table 1: List of all known museum specimens of *Habia atrimaxillaris* and abbreviations of the museums holding specimens

Collection	ID number	Other_IDs	Collectors	Spec_Locality	JJ	MM	TT	Parts	SexCde	Age
AMNH	392440	Dwight Coll. 55665	Smith Austin Paul	Puerto Jimenez	1922	7	16	skin	male	
AMNH	392441	Dwight Coll. 55666	Smith Austin Paul	Puerto Jimenez	1922	7	16	skin	male	
AMNH	392442	Dwight Coll. 55664	Smith Austin Paul	Puerto Jimenez	1922	7	16	skin	male	
AMNH	392443	Dwight Coll. 55667	Smith Austin Paul	Puerto Jimenez	1922	7	17	skin	male	
AMNH	392445	Dwight Coll. 55668	Smith Austin Paul	Puerto Jimenez	1922	7	17	skin	female	
AMNH	392446	Dwight Coll. 55669	Smith Austin Paul	Puerto Jimenez	1922	7	19	skin	female	
AMNH	392444	Dwight Coll. 55670	Smith Austin Paul	Puerto Jimenez	1922	7	22	skin	male	
AMNH	292448	Dwight Coll. 62322	Smith Austin Paul	Puerto Jimenez	1926	10	7	skin	female	
AMNH	392447	Dwight Coll. 62321	Smith Austin Paul	Puerto Jimenez	1926	10	14	skin	male	
ANSP	177231	FBG 1457	Gill Frank	Osa/Madrigal, Quebr. Leona	1981	6	8	skin	male	
FMNH	72809	Armstrong Coll	Smith Austin Paul	Puerto Jimenez	1926	10	12	skin	male	
FMNH	72810	Armstrong Coll	Smith Austin Paul	Puerto Jimenez	1926	10	14	skin	female	
FMNH	72807	Armstrong Coll	Smith Austin Paul	Puerto Jimenez	1926	10	15	skin	female	
FMNH	72808	Armstrong Coll	Smith Austin Paul	Puerto Jimenez	1926	10	18	skin	male	
FMNH	69168		Smith Austin Paul	Puerto Jimenez	1929	12	6	skin	male	
FMNH	69169		Smith Austin Paul	Puerto Jimenez	1929	12	16	skin	male	
FMNH	69170		Smith Austin Paul	Puerto Jimenez	1929	12	16	skin	female	
Hidasi Coll. Brazil	563	LSUMZ32618	Morse Douglass H.	Rincón de Osa, sea level	1964	3	22	skin	female	
LACM	90875		Stager K.E.	Esquina River mouth	1975	4	25	skin	male	
LACM	109932		Campbell Kenneth E.	Rincon de Osa, Tropical Sci. Centre	1969	7	29	skeleton	male	
LSUMZ	138843		Hackett Shannon J.	Marenco Biol. Sta., Pen. Osa, 200 m	1990	1	20	skin, tiss	female	ad
LSUMZ	140228	Schwartz Coll 7532	Paulson Dennis R.	Rincon de Osa	1967	3	16	skin	male	ad
LSUMZ	51115		Morony John J.	12 mi. SSW Palmar Sur	1966	3	18	skin	female	
LSUMZ	32616		Morse Douglass H.	Rincón de Osa, sea level	1964	3	20	skin	female	ad
LSUMZ	32617		Morse Douglass H.	Rincón de Osa, sea level	1964	3	22	skin	female	ad
LSUMZ	32619		Morse Douglass H.	Rincón de Osa, sea level	1964	3	22	skin	male	ad
LSUMZ	32620		Morse Douglass H.	Rincón de Osa, sea level	1964	3	23	skin	male	ad
LSUMZ	48466		Cracraft Joel L.	7 rd. Mi. E Golfito	1965	6	10	skin	male	ad
LSUMZ	48468		Cracraft Joel L.	7 rd. Mi. E Golfito	1965	6	10	skin	male	imm
LSUMZ	50911	421 b Acc Nr.	Cracraft Joel L.	7 mi. E Golfito	1965	6	10	skeleton	female	
LSUMZ	48467		Cracraft Joel L.	7 rd. Mi. E Golfito	1965	6	11	skin	female	
LSUMZ	48469		Cracraft Joel L.	4,2 rd. Mi. E Golfito	1965	6	13	skin	female	
M San Jose	1		Alvarado Ghisselle	Est. Biológica La Gamba, 6 km Golfito	2001			Pieles		
M San Jose	2		Alvarado Ghisselle	Est. Biológica La Gamba, 6 km Golfito	2001			Pieles		
M San Jose	3									
MCZ Harvard	141748	Havemeyer 1242	Smith Austin Paul	Puerto Jimenez	1926	9	24		male	
MCZ Harvard	141749	Havemeyer 1243	Smith Austin Paul	Puerto Jimenez	1926	10	12		female	
UCLA	19706	Dickey	Smith Austin Paul	Puerto Jimenez	1926	10	15	skin	male	ad
UCLA	19707	Dickey	Smith Austin Paul	Puerto Jimenez	1926	10	15	skin	female	ad
Univ. San Jose	1		Stiles F. Gary							
Univ. San Jose	2		Stiles F. Gary							
USNM	487555	185220	Salazar R.	Rincon de Osa	1964	10	29	skin	male	
USNM	487556	185230	Salazar R.	Rincon de Osa	1964	10	29	skin	male	
WFVZ	28102		Williams Andrew E.	Rincon 1,8 miles W	1971	2	17	skin	female	
WFVZ	28103		Williams Andrew E.	Rincon 1,8 miles W	1971	2	17	skin	male	
WFVZ	28101		Kiff Lloyd F.	Rincon de Osa Peninsula	1967	3	16	skin	female	
WFVZ	28100		Stiles F. Gary	Rincon de Osa, appr. 2 km WSW	1971	4	18	skin	male	
YPM	57770	Havemeyer x	Smith Austin Paul	Puerto Jimenez	1926	9	22	skin	female	
YPM	57769	Havemeyer x	Smith Austin Paul	Puerto Jimenez	1926	9	24	skin	female	
YPM	57767	Havemeyer x	Smith Austin Paul	Puerto Jimenez	1926	9	26	skin	female	
YPM	57768	Havemeyer x	Smith Austin Paul	Puerto Jimenez	1926	9	26	skin	male	
YPM	57765	Havemeyer x	Smith Austin Paul	Puerto Jimenez	1926	10	12	skin	male	
YPM	57766		Smith Austin Paul	Puerto Jimenez	1926	10	19	skin	male	

AMNH = American Museum of Natural History, New York; ANSP = Academy of Natural Sciences, Philadelphia; FMNH = The Field Museum, Chicago; LACM = Natural History Museum of Los Angeles County, Los Angeles; LSUMZ = Louisiana Museum of Natural History, Baton Rouge; MCZ = Harvard The Museum of Comparative Zoology, Cambridge; UCLA = University of California, Los Angeles; USNM = Smithsonian National Museum of Natural History, Washington; WFVZ = Western Foundation of Vertebrate Zoology, Camarillo; YPM = Yale Peabody Museum, New Haven.

Henry Osborne Havemeyer (1876-1965) graduated at Yale June 1900. Havemeyer was director of several refining, mining, rail, insurance, and banking companies during his lifetime, and was a member of social clubs in New York, Newport, Florida, and North Carolina. The Havemeyers had homes in New York, Newport, Mahwah, and Lake Wales, Florida. GRISCOM (1933) mentions "For some years past Mr. Henry O. Havemeyer of Mahwah, New Jersey, has been acquiring collections of Costa Rican birds from Mr. Austin Paul Smith, in fact ever since the late Dr. Jonathan Dwight ceased to be Smith's chief customer. ... Havemeyer ... sent me specimens for examination and identification. With so competent a collector as Smith, it has naturally followed that the Havemeyer collection has become increasingly valuable, that it contains a thoroughly representative series of the avifauna of Costa Rica, and now has a remarkably high percentage of the specialities and the great rarities of the country ... Mr. Havemeyer is a busy man of affairs and has little time or leisure for the pursuit of ornithology, so that his collections were never properly determined or worked up and put on record. ... 1931 I asked permission to go to Mahwah, examine his collections, and put on record what interesting items it might prove to contain. This suggestion could not have been more cordially received, and no one could possibly have co-operated in more friendly and generous spirit than Mr. Havemeyer....". The Western Foundation obtained the Havemeyer egg collection from the Peabody Museum (pers. comm. L. Kiff).

Donald Ryder Dickey (March 31st, 1887, Dubuque, Iowa – April 15th, 1932, Pasadena, California, USA (BEOLENS & WATKINS 2003, HARRIS 1934, JOBLING 1991, WOOD 1932)). He entered the University of California in 1906 and graduated from Yale in 1910. Being in possession of abundant means, he was able in the course of ten years to build up not only an excellent working library, but to gather over 50.000 specimens of vertebrates, one of the largest collections in the country. His work was stimulated by personal contacts with J. Muir, J. Burroughs, H. Merriam and E.W. Nelson. Dickey's interest concentrated on the Pacific slope of Central America, especially on El Salvador. His long-time associate was Adriaan J. van Rossem.

Short outline of ornithological research in Costa Rica and of the early history of the Golfo Dulce region

Of course Costa Rican scientific exploration had started much earlier, in the middle of the 19th century (CARRIKER 1910) when Alexander von Humboldt promoted two German scientists, Carl Hoffmann (1823-1859) and Alexander von Frantzius (1821-1877) (ZELEDÓN CARTÍN 1997) who settled in San José in the early 1850s. They influenced scientific life in San José sustainably. One of their students was José Castulo Zeledón (1846-1923), co-founder of the National Museum in San José. The Austrian Karl Scherzer (1821-1903)

also contributed to the geographical exploration of Costa Rica in these early stages. It is a Costa Rican tradition to promote positive foreign influences and use them to their best. The Costa Rican scientists, Alfaro Anastasio (1865-1951), Alberto Manuel Brenes (1870-1948), José Fidel Tristan (1874-1932) and Colodmiro Twight Picado (1887-1944) experienced an immense increase in scientific exploration of North American ornithologists like Robert Ridgway (1850-1929), Outram Bangs (1863-1932), George K. Cherrie (1865-1946), Cecil F. Underwood (1867-1943), Melbourne Armstrong Carriker (1879-1965), Alexander F. Skutch (1904-2004) and Paul Slud (1919-2006), etc. (GONZÁLEZ 1976, JANZEN 1983, SAVAGE 2002).

When A. P. Smith made his collections in Puerto Jiménez and surroundings this region was only poorly populated by subsistence farmers, loggers and gold washers.

FRANTZIUS (1869) reports about the situation as known in the 19th century: "... Golfo Dulce was already discovered in 1516 by Gasp. Espinosa who named it Golfo de Osa. Evidently, earlier maps (G. Lafond, Carte de la Republique de Costarica, Paris 1851) show a vast lagoon named Laguna de Sierpe north of Golfo Dulce ... The real dimension and outline of the gulf only became known by the cartography of Maury de Lapeyrouse during the year 1850 ... Except the Indian trail along the Pacific coast following the northern banks of the Terraba river via Buenaventura and Camarronal to Boruca and Terraba and from there via Canas Gordas and Chiriqui to Panama, there are only two more trails leading northeast over the mountains to the Sixaula valley. All these trails are only footpaths and difficult to pass with mules because no improvement is done at all. ..." (translation vom FRANTZIUS 1869).

LOBO & BOLAÑOS (2005) summarised the history of the Golfo Dulce and Osa peninsular region as follows. In the 1830s, the coasts of the peninsula were only thinly populated by subsistence farmers and fishermen mostly originating from Chiriqui then in Colombia, now Panama. Around the 1850s, French interests in developing agriculture failed as well as an attempt from the United States planning to translocate former slaves into the region after the War of Secession. BANGS (1907) summarises the situation perfectly: "... Original conditions still prevail in western Costa Rica, and there are enormous stretches of virgin forest and perfectly wild country, and the lowland forest birds are safe for a time at least. I have, however, grave fears that many of the very rare and still but little known species of the Atlantic lowland forest are doomed. The banana industry is sweeping away the forest at a terrible rate, and in the few years since the United Fruit Company established

itself at Port Limon the forest has been entirely cleared away not only directly about that place, but way south into the famous Talamanca District. Very few of the forest birds take kindly to banana plantations, and as the forest goes they go with it. ..." The main settlement on the Osa Peninsula changed its name from Puntarenitas to Santo Domingo in 1873 and to Puerto Jiménez in 1917. In 1884 Santo Domingo's population existed of 95 houses with 377 people, 342 of them foreigners (Chiriquenos). All of them were of the Catholic faith, 322 unmarried and only 24 were able to read and write. In 1917, the town already had around 800 inhabitants but still a very poor infrastructure. In the 1920s and 1930s, huge land territories were sold to the logging industry, 1927 at Rio Rincon, 1932 at Rio Sierpe and 1933 at Corcovado. As early as 1878, border conflicts arose in the Coto area because of the influence of settlers from Chiriqui. This conflict culminated in a border war during 1921 and border agreements were only fixed in 1941. Beside the logging industry, the United Fruit Company increased its interests since the 1920s. Their land holdings of 100.000 ha in the late 1930s had the character of an enclave.

This historical outline makes a better understanding of how remote this region was during the time of A. P. Smith's collecting and how far it was from the political influence in San José. The next centres along the Pacific coast were Quepos and Puntarenas, Golfito remained a small village until the 1930s. On the other hand, exploitation of natural resources and landscape transformation increased immensely without any environmental concern.

Ornithological analysis took place far away in the United States by scientists working on A. P. Smith's collections. We can only be astonished about hearing that ornithological experts believed the Costa Rican avifauna was already thoroughly investigated at this time.

The Golfo Dulce region from the 1930s until the 1960s

The Austrian expedition (botanists Georg Cuodontis and Otto Porsch, zoologists Otto Koller, Eduard Reimoser, Moritz Sassi (ornithologist) and Rudolf Zimara, taxidermist Alfred Stadler and photographer Franz Jarowsky) stayed in Puerto Jiménez from March 29th until April 16th 1930 (SASSI 1938, 1939, BAUERNFEIND 1996). All bird specimens are deposited at the Natural History Museum in Vienna but they did not collect *Habia atrimaxillaris*. SASSI (1928) describes the situation: "... Our first station Porto Jiménez is a relatively young settlement at the Golfo Dulce ... The surroundings of Porto Jiménez are deforested and covered with fields and mainly pastures (Potreros). The coast is

framed with mangroves except the small sandy beach. The primary forest is met after an hour's walk into the interior and is only disturbed locally by small fincas with small fields. The region is flat with only moderate elevations in the interior. On the opposite side of the Golfo Dulce, the situation is quite different. The hills rise immediately from the sea coast. The Golfito resembles a fjord. The banks are very steep and covered with forest down to water level..." (translated).

During the 1930s the United Fruit Company increased its banana production. The first attempts of banana planting in the Corcovado lowlands failed and new projects developed starting from the Rio Coto region. Changing communication possibilities translocated the headquarters of banana industry from Puerto Jiménez to Golfito. In 1939, still only 40 families lived in Golfito. From 1938 until 1941, the breakwater was built and in 1937, the construction of a railway connection from Golfito to Palmar started. This brought a massive influx of labourers especially from Guanacaste, Nicaragua and Honduras. Golfito was thus a divided settlement with different "barrios" for the rich entrepreneurs and the poor labourers. Railway construction was done by engineers from Spain, Yugoslavia, the United States and Costa Rica. Even an Austrian, Ing. Emil Streichem, was involved. The first plans included a tunnel from the current site of the airport in Golfito to the La Gamba river. This project might have changed and damaged the tropical rainforests of the La Gamba region for ever, but environmental constraints diverted the railway line towards Coto (LOBO & BOLAÑOS 2005).

Since the late 1950s, the construction of the Interamericana highway changed the area again sustainably because of the influx of "campesinos sin tierra", poor landless farmers looking for arable land (ALONSO 1999, LOBO & BOLAÑOS 2005). The growth of Golfito in the 1940s, the new railway and the new road connections by the Interamericana might also have mainly contributed to the establishment of the community La Gamba with connections to Golfito and to the Interamericana.

Further collecting and start of ecological studies

Between 1929 and 1962, there was quite a long gap in collecting and reporting about *Habia atrimaxillaris*. The region of the Osa Peninsula was still quite remote and difficult to access. It seems plausible that collecting started again with the establishment of field-stations on the Osa Peninsula in the early 1960s. The Organisation of Tropical Studies (OTS) was founded in 1963 and immediately started with field stations in Costa Rica (BURLINGAME 2002, JANZEN 1983). These projects regularly brought academic teachers and biology students into the region.

It is interesting to hear about observations and collecting of *Habia atrimaxillaris* by the scientists themselves:

DAVIS & DAVIS (1962) report about a bird census in humid tropical forest: "... 7 km NW of Corredor, Costa Rica (28 km above Panama border) and on the south side of the road. Size: 15 acres (rectangular, 220 E-W by 330 N-S yards paced. Description of Area.: Partially cleared, mature, tropical forest (wet tropical under the Holdrige classification). At least half of the largest trees have been removed in the last few years, leaving small clearings where each one fell. These clearings have grown up in tall weeds for the most part, but some near the trails are grassy (grass 2 to 3 ft. high). The remaining large trees are about 20 ft. apart and up to 100 ft. tall. There are numerous smaller trees, shrubs and vines. The largest remaining tree is a Ceiba about 8 ft. in diam. and over 100 ft. tall. Tree ferns and dwarf palms are scattered through the understory. There is a cleared pasture just to the south of the tract. Topography: Almost flat; gentle slope toward the south. A small creek runs along the south border and a narrow gully across the northeast corner into a small swampy spot. Elevation, 150 ft. Climate: Hot and humid. There is seldom a day without some rain. ... Total: 86 species ...".

SLUD (1964) writes in his avifauna of Costa Rica about *H. atrimaxillaris*: "... I met it several times near Piedras Blancas on the mainland side and at Rincón de Osa at the head of the Gulf. Evidently it is common locally, and perhaps ranges continuously, in the gulf-bordering lowlands; possibly it inhabits the entire Osa Peninsula. On the mainland, however, I did not happen to find it farther south in the Coto District, where it has recently been reported by DAVIS & DAVIS (1962). ... Isolated in a lowland pocket with an average annual precipitation of 200-250 inches, the species probably does not occur in nearby, drier Panama. It frequents the shaded understory in advanced second growth, or sub-forest, merging with tall virgin woods and occurs a little inside broken, selectively logged forest. In general, I found it closer to the ground than the more arboreal *fuscicauda*. I saw it singly and in groups of several, usually lively and noisy, individuals dashing about, coming to sudden stops in foliage, shaking leaf clusters as do heavy-bodied antshrikes, looking around while perched, then dashing off again; also, I saw several together on the ground. The birds appeared to be sedentary at a site. Sometimes they acted shyly, other times not. Though probably animalivorous, this ant tanager was regularly squeezing the juice from small fruits. I did not see it with army ants. Its scolding, harsh "zurzurzur" and tearing wrenlike note sounded much like the noises of *fuscicauda*. The bird also made a rapid excited chatter that I do

not recall hearing from *fuscicauda*, short and weak but resonant "chek"s or "chuk"s, and scratchy "tchek"s while dashing about. I heard no song during my meetings with it in March, July and August."

Douglass H. Morse (Brown University, Rhode Island, USA) collected 4 specimens for LSUMZ, and one came to the Hidasi Coll. in Brazil. (Pers. comm. Douglass H. Morse): "... My catalogue indicates that I collected two males and three females from 20-23 March 1964 at Rincon de Osa. I was then a graduate student at the Museum of Zoology, Louisiana State University, working under George Lowery, who is responsible for the emphasis that the Museum still puts on tropical American species. I was there doing field work on mixed-species flocks and doing some collecting as time allowed for the Museum. Considering my focus it is surprising how little I have about *Habia* in my notes, though it was apparent that I was more interested in *Rhamphocelus* and *Coroebia* and the wintering wood warblers loosely attached to them ... Here is the sum total of what I have about *Habia*. 'The ant tanagers (*Habia atrimaxillaris* – several specimens collected) are also apparently quite aggregated also, several sometimes being attracted at once, perhaps in conjunction with the woodcreepers, wrens, etc. ... Gonads on all the birds mentioned above have been greatly enlarged.' In an earlier paragraph I note that all of the birds alluded to were aggregated, though that might have been somewhat exaggerated because of their attraction to 'squeaking' sounds that I made on the back of my hand. The *Habia* were in seemingly virgin alluvial forest within a few hundred meters south of Rio Rincon. At the time this area was little touched, though a timber operation had recently commenced there (Osa Productos Forestales – a North American group, I think). In fact I stayed at their quarters, being flown into their jungle airstrip from San José. This area, if not conveniently on maps was at the head of the peninsula, not too far from the Gulf of Rincon.... I'm sure that I knew that this species was a range-restricted endemic, since I would have had Eisenman's check-list with me at the time. However, I was primarily interested in ant-tanagers in terms of their flocking predisposition, such that the localised nature of this species would probably not have caused me to pay them extra attention."

Joel L. Cracraft (American Museum of Natural History, New York, USA) collected five specimens for LSUMZ (1965, June 10-13) when he was a grad student (pers. comm.).

Dennis Paulson (University of Puget Sound, Tacoma, USA) collected one specimen for the Schwartz coll., now LSUMZ (1967, March 16). (Pers. comm.): "... I lived in Costa Rica for 14 months in 1966-67, and

among many other projects, I collected a few hundred bird specimens for several ornithologists. Albert Schwartz was a long-time friend and colleague who had taken or sent me on a number of collecting expeditions (mostly for herps) to the West Indies when we both lived in Miami, and I was doing him the favour of acquiring some Costa Rican birds for his collection. ... But as I was not conducting research on any particular avian species, I do not have specific notes on the *Habia* I collected other than what is on the specimen. It was collected near the field station adjacent to the airport used by the Organisation for Tropical Studies at that time. The species was common there. My visit was definitely not an “expedition,” just a short visit to the Peninsula de Osa while I was teaching in the OTS program there. I managed to collect a small number of birds while doing my own research on Odonata, and of course I attempted to get specimens of local endemics such as *H. atrimaxillaris*. Albert Schwartz was one of the last private collectors, his work funded by both personal money and grants he received“

Albert Schwartz (Sept. 13th, 1923, Cincinnati – October 18th, 1992, Miami). Best known for his work on West Indian zoology, especially butterflies, having published 230 papers (BORKIN 1994). Schwartz studied at the universities of Cincinnati, Miami and Michigan. His career started as Curator of Vertebrate Zoology at the Charleston Museum in South Carolina; in 1956, he moved to Reading, Pennsylvania where he taught at the Albright College. Most of his life was spent teaching at the Miami-Dade Community College in Florida from 1967 until 1988. His butterfly collection was donated to the Milwaukee Public Museum.

John Morony collected *Habia atrimaxillaris* in 1966, March 18th: “I was a graduate student at that time (LSU, Baton Rouge) and was requested by the Museum Director, Dr. George H. Lowery ... on a rather short collecting expedition to El Salvador and Costa Rica. ... ” (pers. comm.).

Lloyd F. Kiff (Natural History Museum of Los Angeles County) collected one *H. atrimaxillaris* specimen on March 16th 1967, being engaged in field studies together with Andrew Williams in SW Costa Rica. He mostly worked in the vicinity of Sierpe, 13 km south of Palmar Sur, but did not refer to *H. atrimaxillaris* (KIFF 1975). (Kiff, pers. comm.) “ ... I collected the specimen while I was a student in an Organization for Tropical Studies course. ... it was mist-netted in the vicinity of the OTS field station (by the airstrip). I originally started working in the neotropics in 1961, when I accompanied Dr. Hugh Land on a summer-long collecting trip to Guatemala. ... Upon graduating from college in 1964, I had an opportunity to work in Costa Rica for two months on a high-security project funded by the U.S.

military establishment in connection with the Vietnam War. As possible, I collected birds at the various, ecologically diverse localities that we visited, and gaining a working knowledge of Costa Rican birds ... It was clear from my 1964 experience that Costa Rica is really a splendid country from an ornithological standpoint, and I returned there happily many times between 1967 and the early 1970s, sometimes working for OTS and sometimes working on my own research. Along with Gary Stiles, who was my office partner in grad school at UCLA, we started the field guide that was ultimately co-authored by Gary and our good friend, Alexander Skutch. ...”

Roberto Salazar collected together with Paul Slud (American Museum of Natural History, New York and Smithsonian Inst. National Museum of Natural History, Washington) and A. and P. Puleston in Costa Rica between August 1964 and April 1965. His obituary in the Washington Post March 6th, 2006 mentions this field trip as follows “ ... Soon after joining the Smithsonian Institution, Mr. Slud travelled to Costa Rica as part of a research project assisting the Army on bioecological classification for military environments. An important objective of the Army project was to study a variety of habitats in detail to classify and predict plant formations and the distribution of birds (per. comm. C. Ludwig, Smithsonian Inst., Washington). The “military” project that employed Kiff and, separately, Paul Slud and Peter Puleston was under the auspices of the Advanced Research Project Agency (ARPA) (Kiff pers. comm.). Kiff writes “Specifically, we were testing a method of rapidly surveying habitats using physiognomic vegetation characteristics (e.g., size and spacing of trees, presence of spines on tree trunks, etc.) in hopes that field commanders in Vietnam could drop a couple of surveyors behind the lines for a half day and get a predictive assessment of vegetative features of areas slated for invasion that would allow them to judge whether they could get tanks or small trucks through an area, just small patrols on foot, or whatever. Our project was done under Tropical Science Center auspices in Costa Rica, and this meant that we worked for Leslie Holdridge ... Holdridge was the genius who purchased Finca La Selva originally before eventually turning it over to OTS. As a part of our project, we visited and surveyed at least one example of every single Holdridge habitat category as they occurred in Costa Rica in 1964”

Kiff also recalls the massive habitat destruction in Costa Rica during this time. Whatever the U.S. army learnt from *Habia atrimaxillaris*, we thank this trip an interesting specimen.

Kenneth E. Campbell (Natural History Museum of Los Angeles County, Los Angeles, USA) collected one



Fig. 4: *H. atrimaxillaris*, nest and juveniles, La Gamba Febr. 2008 (Photo W. Huber)

specimen for LACM in July 29th, 1969 (Pers. comm.): “There is not much I can tell you about the *H. atrimaxillaris* specimen. It was saved when it accidentally died during a student catch-and-release study. No expedition was involved, and there are no field notes regarding it of which I am aware.”

While associated with the Louisiana State University School of Medicine and its International Center for Medical Research and Training in Costa Rica ARNOLD (1966) collected for the Louisiana State University in June 1965 near Golfito but did not refer to *H. atrimaxillaris*. WOLF (1966) and FOSTER & JOHNSON (1972) as well do not mention the species during their stay in SW Costa Rica.

When banana production ceased in the 1970s, vast stretches of land were transformed into oil palm plantations. Small scale subsistence farming continues to exist. In the 1970s, nature protection increased with the foundation of the Corcovado National Park (1975) and the Reserva Forestal de Osa (October 24th, 1978). In the same way, the logging industry lost influence (LOBO & BOLAÑOS 2005).

Andrew E. Williams (Wanneroo, W Australia) formerly worked for the Western Foundation of Vertebrate Zoology and participated in Costa Rica, Madagascar and Kenya projects. He collected two specimens for WFVZ. Andrew Williams spent several months working on the Osa Peninsula as a collector for the WFVZ (1971 Feb. 17th).

F. Gary Stiles (Univ. Nacional de Colombia, Bogotá, Colombia) collected one specimen for WFVZ and two for the University of San José collection (1971

April 18th). (Pers. comm.): “... When in Rincón de Osa in 1971 I was with the Western Foundation of Vertebrate Zoology; the person who spent most time in this area at that time was Andrew Williams. ... On a number of visits to the Osa and other localities in SW Costa Rica in subsequent years I observed this species, recorded it and collected one or two specimens for the Universidad de Costa Rica although it was never the object of a special study of mine.”

Kenneth E. Stager (Los Angeles County Museum of Natural History, USA) collected one specimen for LACM.

Edwin O'Neill Willis made the most detailed study about *Habia atrimaxillaris* up to now (WILLIS 1972). He studied at the Louisiana State University and at the University of California, Berkeley during the 1950s. Later, he worked at the American Museum of Natural History and became university professor at Universidade Estadual Paulista Júlio de Mesquita Filho, Rio Claro, Brazil in 1986. Willis' first field studies on tanagers and ant-tanagers in Central and South America yielded many new aspects about behaviour and ecology (WILLIS 1960 a, b, 1961, 1966, 1972). WILLIS' (1972) studies confirmed Paul Slud's field observations and he summarises in his abstract: “Morphological and behavioural differences among the allopatric red-throated (*Habia fuscicauda*), black-cheeked (*H. atrimaxillaris*), and sooty (*H. gutturalis*) ant-tanagers suggest that they are separate species. Only the first species has strong sexual dimorphism; only the second has courtship feeding; and only the third has a rapid ‘chatter’. All three forage diversely, capturing insects and fruit, but stay low in woodland undergrowth; all follow army ants. ... black-cheeked ant-tanagers were briefly studied in patches of second growth and high forest on the steep ridge east of the south end of the town of Golfito... ”

Scarce scientific information since the 1970s

ISLER & ISLER (1987) only summarise the findings of SLUD (1964) and WILLIS (1972) about *H. trimaxillaris* in their monography of tanagers and MOUNTFORT (1988) mentions “... is known only from south-west Costa Rica.”

STILES & SKUTCH (1989) published the most used field guide to the Birds of Costa Rica with probably the first picture of *H. atrimaxillaris* and both authors experienced *H. atrimaxillaris* by themselves. “... Nest: Unknown (?). Bird with nesting material in March; fledglings in May...”.

The last collections were made by

- Dr. Frank Gill (Academy of Natural Sciences, Philadelphia and National Audubon Society), one specimen for ANSP, 1981, June 8th,

- Shannon J. Hackett (Field Museum of Natural History, Chicago, USA) one specimen for LSUMZ, 1990 Jan. 20th and
- Quesada Ghiselle Alvarado (Natural History Museum, San José, Costa Rica), three specimens for the Museum in San José).

In February W. Huber and A. Weissenhofer found and described the first nest and nestlings of *H. atrimaxillaris* near to the Tropical Station La Gamba (HUBER et al., submitted Brenesia) (Fig. 4).

Conservation and birdwatching

Birdwatching in the Golfito area often focuses on *H. atrimaxillaris* as outlined by SEKERA A.D. (1996) who spotted this species near Golfito and the Esquinas Lodge at La Gamba. WorldTwitch as an example for advertising birding at Golfito writes: "Black-cheeked ant-tanager (*Habia atrimaxillaris*) was the best bird seen here, the rest being fairly common, expected spp. of lowland forest along the south Pacific slope. The ant-tanagers were seen along the top part of the road" (http://www.worldtwitch.com/costa_rica_odonnell.htm).

CAPPER et al. (1998) refer to recent sightings during field work around Corcovado National Park, May 1998. "... *H. atrimaxillaris* has a very small range in the Golfo Dulce lowlands of Costa Rica, but was common within Corcovado National Park. Most records were of small groups and family parties (3-6 birds), associating with small flocks in the understorey of dense lowland forest. However, it was not restricted to this habitat type, and small numbers were recorded in palms and beachfront scrub adjacent to the park."

The conservation status of *Habia atrimaxillaris* changed negatively since 1988:

- 1988 – Threatened (COLLAR & ANDREW 1988)
- 1994 – Vulnerable (COLLAR et al. 1994, STATTERSFIELD et al. 1998)
- 2000 – Endangered (STATTERSFIELD & CAPPER 2000)
- 2004 – Endangered (BirdLife International 2004)

These changes of the conservation status are due to increasing knowledge of the vulnerability of habitats within the area of *Habia atrimaxillaris*. Any statements about its real population size are only based on rough estimations and not on distinct studies.

In February 2003, the Government of Costa Rica nominated the Corcovado National Park and Cano island biological reserve for inclusion in the World Heritage Site list under the World Heritage. — <http://www.corcovadofoundation.org/w-heritage-site.pdf>. 1-53.

The local organisation ASOPROBI (Asociación pro bienestar la Gamba) developed as an agricultural community with about 80 families situated at the border of the Piedras Blancas National Park. Its aim is to improve the living conditions of the community as well as conserving biodiversity by means of sustainable economy like ecotourism.

InfoNatura (Birds, mammals, and amphibians of Latin America [web application]. Version 4.1. Arlington, Virginia (USA): NatureServe. Available: <http://www.natureserve.org/infonatura>). (see also RIDGELY et al. 2005) summarises the recent conservation situation:

"... The species is classified as **Endangered** because of its small range which is mostly confined to two protected areas. The large reduction in habitat indicates that there are ongoing declines in range and population area. Somewhat paradoxically, as it becomes entirely confined to the protected areas, the extent of its range is likely to stabilise and it will be classified as Vulnerable ...

Population estimate: > 10.000, Population trend decreasing (continuing), Range estimate 990 km².... This range has approximately halved since 1960, and it has become increasingly scarce in the fragmented habitat outside Corcovado National Park and Golfito Faunal Refuge. However, populations appear stable in these protected areas, and it remains common in Corcovado. ...

Ecology: It inhabits the understorey of dense lowland forests, advanced secondary growth and occasionally selectively logged forest, palm trees and beach-front scrub. It lives in family groups, sometimes accompanying mixed-species flocks. It feeds primarily on arthropods, but also on melastome berries. ...

Threats: The vast majority of the forest to the north and east of the Golfo Dulce has ... loss is continuing outside protected areas.

Action: Corcovado National Park is a very important site for this species. ... A significant population, but the habitat is disturbed and fragmented.

Targets: Survey the Golfito Faunal Reserve to determine the status of this species ... habitat outside existing protected areas."

ROJAS & CHAVARRIA (2005) outline the importance of protecting and managing biological corridors in Costa Rica. The corridor Paso de la Dante on the Pacific coast is considered as representative for the distribution of *Habia atrimaxillaris* as well as for *Trogon bairdii*, *Pteroglossus frantzii*, *Melanerpes chrysauen*, *Manacus aurantiacus*, *Thamnophilus bridgesii*, *Thryothorus semibadius* and *Euphonia imitans*.

The increasing negative classification in the Red Lists is due to the landscape development in SW Costa Rica during the 20th century resulting in forest fragmentation. Forest birds are the most affected species as also shown from different lowland rainforest regions in Costa Rica (SIGEL et al. 2006) or Amazonia (LAURANCE et al. 2002). Therefore the bird species *Habia atrimaxillaris* can be seen as a good representative for the whole ecological lowland forest ecozone in the Golfo Dulce area. Studies about *Habia atrimaxillaris* still needed should primarily focus on its autecology. For protection management it is necessary to know how far forest fragmentation already influences populations negatively in order to manage and protect corridors for a viable metapopulation. The Tropical Research Station La Gamba seems to be an excellent location for studying *H. atrimaxillaris*.

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